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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BAREFORD, KATHERINE A

ART UNIT

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1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/553,597	Applicant(s) TOURNIER ET AL.	
	Examiner Katherine A. Bareford	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/05, 6/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The preliminary amendment of October 18, 2005 has been received and entered. With the entry of the amendment, claims 1-22 are pending for examination.

Information Disclosure Statement

2. The information disclosure statement filed October 18, 2005 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

No copies of the Foreign Patent Documents cited or the Non-Patent Literature Documents cited have been provided, and thus, these documents have not been considered.

The Examiner notes that the listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to

be listed. In addition, each IDS must include a list of all patents, publications, applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

Claims

3. The Examiner notes that (1) in claim 3, lines 2-3, the features following "preferably" do not further limit the claim; (2) in claim 4, lines 2-3, the features following "preferably" do not further limit the claim; (3) in claim 10, line 3, the features following "preferably" do not further limit the claim; (4) in claim 11, lines 2-3, the features following "in particular" do not further limit the claim; (5) in claim 12, line 2, the features following "and is in particular" do not further limit the claim; and (6) in claim 13, line 3, the features following "and is preferably" do not further limit the claim.

Claim Objections

4. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 2 depends from claim 1 and provides that the quantity of material is constituted by powder. However, parent claim already requires that the coating material comprise powder, and thus claim 2 does not further limit claim 1. If applicant is intending to mean that the material “consists” of powder, the term “constituted” does not provide this limitation.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 19-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19, line 2, provides that the device or “apparatus” claim depends from method claim 1. However, As noted in MPEP 2173.05(p).II : “A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *> IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005);< Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990).”

Claim 22, line 1, provides that the device or “apparatus” claim depends from method claim 1. However, As noted in MPEP 2173.05(p).II : “A single claim which claims both an apparatus and the method steps of using the apparatus is indefinite under 35 U.S.C. 112, second paragraph. *> IPXL Holdings v. Amazon.com, Inc., 430 F.2d 1377, 1384, 77 USPQ2d 1140, 1145 (Fed. Cir. 2005);< Ex parte Lyell, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990).”

Claim 22, line 1, this claim depends from claim 1, however, it appears that the claim should depend from any of claims 19-21, as the claim is directed to a “further” characterization of the device.

The other dependent claims do not cure the defects of the claims from which they depend.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were

made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, 5, 6, 13 and 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli et al (US 5834066) in view of Payne et al (US 6503575).

Kunzli teaches a method for coating an object (substrate) to be coated with a meltable coating material. Column 7, lines 5-15. A flame is produced which has a maximum flame speed and a flame direction along a flame axis. Figure 1 (note nozzle bore 17 and axis 13), and column 2, lines 10-20 (the flame jet passes along the nozzle), column 3, lines 30-40 (flame jet speed of 1500-2000 m/s). The flame would be directed towards the object to be coated. Figure 1 and column 7, lines 5-15 (as the material exits nozzle 6 onto the substrate). A quantity of meltable coating material is introduced into the flame. Column 3, lines 30-40, column 5, lines 30-40 (feeding through bores 14) and figure 1. The meltable coating material can be powder (which would have particles). Column 5, lines 45-50. The flame has a temperature which is sufficiently low that the particles of the powder are not completely evaporated during spraying, but is sufficiently high for the particles of the powder to be at least partially melted. Column 3, lines 30-40 (the melted material impacts the substrate, indicating not completely

evaporated) The melted coating material is projected onto the object to be coated.

Column 3, lines 30-40 and column 7, lines 5-15.

Claim 2: the material can be powder. column 5, lines 45-50.

Claim 5: the material is introduced into the flame in at least one introduction direction that can have a radial component relative to the flame axis. Figures 1 and 4 and column 5, lines 30-40 (radial bores 14).

Claim 6: the introduction direction is substantially radially relative to the flame axis. Figures 1 and 4 and column 5, lines 30-40 (radial bores 14).

Claim 13: the maximum flame speed can be 2000 m/s. Column 7, lines 10-15.

Claim 19: the device taught by Kunzli for the coating includes a burner connected to a source of combustible gas which produces a flame in a flame axis. Figures 1-2 and column 6, lines 5-30. Injector means are provided for introducing a meltable coating material into the flame. Column 5, lines 30-40 (radial bores 14), column 3, lines 30-40 and figures 1, 4. The injector means are suitable for introducing the meltable coating material into the flame in the form of a powder. Column 5, lines 45-50. If by the "means" applicant is invoking 35 USC 112, 6th paragraph, the Examiner notes that the injector means corresponds to the "injector" described by applicant in the specification (see page 4, last paragraph of the specification).

Claims 20-21: the injector means introduces a mixture of coating material /conveying gas (oxygen, for example) into the flame in an introduction direction.

Column 5, lines 30-40, 45-50 and 64-67. The introduction direction can be substantially radially relative to the flame axis. Figures 1, 4.

Kunzli teaches all the features of these claims except that the flame speed and distance from the object to be coated are selected to provide that the meltable coating material is at least partially molten at the time of impact (claim 1).

However, Payne teaches processes for thermal spraying include high velocity oxy-fuel deposition, flame spray, plasma spray, etc. Column 1, lines 15-30. In the high velocity oxy-fuel, for example, powdered coating material is injected into the nozzle and heated to near or above its melting point, with the temperature and velocity of the gas stream being adjustable. Column 2, lines 25-40. The molten particles impinge on the surface to be coated. Column 2, lines 25-40. In the flame spray process, powder, for example, is injected into the flame where it is melted and accelerated. Column 2, lines 55-65. The maximum gas temperature is controllable. Column 2, lines 55-65. The molten particles are projected against the surface to be coated, forming adherent splats. Column 2, lines 55-65. Payne teaches that in thermal spray processes, variations in gas stream velocity from the thermal spray device can result in variations in particle velocities and hence dwell time of the particle in flight, which affects the time the particles can be heated and accelerated, and hence the maximum temperature and velocity of the particles. Column 6, line 50 through column 7, line 5. Dwell time is also affected by the distance the particle travels between the torch or gun and the surface to be coated. Column 7, lines 1-5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli to optimize both the precise maximum flame speed and distance between the object to be coated and the flame as suggested by Payne in order to provide a desirable spraying condition for the specific material to be sprayed, because Kunzli teaches a thermal spraying process for flame spraying a molten material and Payne teaches that when thermal spraying, it is well known that variations in gas stream velocity (which would correspond to the flame speed) and distance that the particles travel are result effective variables that affect the dwell time and thus the resulting coating, and one of ordinary skill in the art would optimize known result effective variables, as "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Furthermore, these conditions would be selected to also provide that the material is at least partially molten at the time of impact, as Kunzli teaches spraying a melted material and Payne also teaches that in such flame spraying process, the molten particles impinge on the substrate, indicating desirably molten at time of impact.

10. Claims 3-4 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne as applied to claims 1, 2, 5, 6, 13 and 19-21 above, and further in view of Pettit, Jr et al (US 4696855).

Kunzli in view of Payne teach all the features of these claims except (1) the particle size (claims 3, 4), and (2) the introduction direction relative to the longitudinal axis of the object to be coated (claims 7-9).

However, Pettit teaches that when thermal spraying (Pettit exemplifies plasma spraying, but is not limited to plasma spraying), it is well known to provide a substrate with a relative longitudinal direction relative to the spray gun (as shown in figure 1, in this case the longest length axis is in the up and down direction). Figure 1 and column 1, lines 55-65 and column 3, lines 1-10. Pettit further shows that radial injectors that inject particles into the spray stream can extend in parallel with the up and down longitudinal axis so that the introduction direction of the particles is parallel to the longitudinal axis. Figure 1 (see lines 32 and ports 22) and column 3, lines 15-50. At least two introduction directions can be provided. Figure 1 and column 3, lines 25-35 (the different lines 32 and ports 22, for example). These introduction directions can also extend symmetrically at one side and the other of a plane which comprises the flame axis. Figure 1 (see lines 32 and ports 22). The direction also extends perpendicularly to the longitudinal axis of the object to be coated (the opening bend of line 32 where the figure says "To Powder Feeder" before it becomes parallel to the object's longitudinal axis). Figure 1. Pettit also teaches that known particle sizes to use in thermal spraying can conventionally be 50-90 microns in size, for example. Column 6, lines 8-11.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne to use particle sizes in the range

of 50-90 microns, for example, as suggested by Pettit with an expectation of desirable spraying results, because Kunzli in view of Payne teach thermal spraying with powder, and Pettit teaches conventional particle sizes for thermal spraying. It would further have been obvious to modify Kunzli in view of Payne to provide the introduction direction relative to the longitudinal axis of the object to be coated as suggested by Pettit with an expectation of desirable spray results, because Kunzli in view of Payne provide thermal spraying onto an object with multiple introduction ports in that are radial to the flame axis and Pettit teaches that when thermal spraying it is conventional to coat an object with a longitudinal axis and to provide multiple radial ports in a position to introduce powders in a positioning as claimed.

11. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne as applied to claims 1, 2, 5, 6, 13 and 19-21 above, and further in view of Japan 2001-150185 (hereinafter '185).

Kunzli in view of Payne teach all the features of these claims except the specific spraying material used (claims 10-12).

However, '185 teaches that it is well known to flame spray coat a Zn-5%Al alloy material by flame spraying. See the abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne use a Zn-Al alloy with 5% Al, for example, as the coating material as suggested by '185 with an expectation of

desirable spraying results, because Kunzli in view of Payne teach thermal spraying with powder, that can be metal (see Kunzli, column 1, lines 40-55, Payne, column 1, lines 20-25), and '185 teaches conventional material applied by a flame spraying process. This alloy would provided the claimed melting point of claim 10 and one of ordinary skill in the art would understand the 5% Al to be referring to wt% Al, as Zn-%Al is the conventional format for describing such wt% alloys.

12. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne as applied to claims 1, 2, 5, 6, 13 and 19-21 above, and further in view of Popoola et al (US 6017591).

Kunzli in view of Payne teach all the features of these claims except the use of waste powder and its origin (claims 14-15).

However, Popoola teaches spray coating by various processes that project particles. Column 3, lines 55-60 and column 4, lines 50-55. Popoola teaches that it is desirable to recover and recycle waste particles formed during application. Column 5, lines 15-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne to recover and recycle waste products formed during a projection application as powders for the present spraying, as suggested by Popoola with an expectation of desirable spraying results, because Kunzli in view of Payne teach thermal spraying with powder, and Popoola teaches that it is

desirable to recover and recycle waste particles formed during projection application, and particles are what the Kunzli in view of Payne uses to apply the coating.

13. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne and Popoola as applied to claims 14-15 above, and further in view of Powers et al (US 4011073).

Kunzli in view of Payne and Popoola teach all the features of these claims except (1) sieving the unprocessed waste powder (claim 16), and (2) drying/deoxidizing powders (claim 17).

However, Powers teaches making flame spray powders. Column 1, lines 5-10. When recycling powders as part of this flame spray powder making process, Powers teaches screening (sieving) the particles when making the powder to remove outsize agglomerates and then retreating and rescreening the outsize agglomerates to recycle. Column 2, lines 25-30 and 60-68. Furthermore, Powers provides spray drying the powders as part of the powder making process. Column 1, lines 60-65 and column 2, lines 20-25.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne and Popoola to screen and dry the recycled waste powder, as suggested by Powers with an expectation of forming desirable powders for flame spraying, because Kunzli in view of Payne and Popoola teach thermal spraying with powder and the suggestion to recycle powder, and Powers

teaches to form desirable powders ready for flame spraying by a process that includes screening and drying the component materials and powders to form an acceptable powder for flame spraying.

14. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne as applied to claims 1, 2, 5, 6, 13 and 19-21 above, and further in view of Heitz (US 5445514).

Kunzli in view of Payne teach all the features of this claim except the maximum temperature of the flame.

However, Heitz teaches that when flame spraying with a high velocity process, it is well known for the flame temperature to be 5000 degrees F (2760 degrees C). Column 8, lines 15-20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne to use a flame temperature in the range of 2760 degrees C, for example, as suggested by Heitz with an expectation of desirable spraying results, because Kunzli in view of Payne teach high velocity thermal spraying with powder, and Heitz teaches a conventional flame temperature for such a process, and since only one temperature is taught, it would be inclusive of the maximum flame temperature of the process.

15. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kunzli in view of Payne as applied to claims 1, 2, 5, 6, 13 and 19-21 above, and further in view of Huhne (US 4835022).

Kunzli in view of Payne teach all the features of this claim except the mixing device to mix the powder and conveying gas.

However, Huhne teaches that when providing powder to a thermal spraying device it, it is well known to provide a mixer (see 52) where a conveying gas inlet (from line 30) connected to a conveying gas source (44) is provided and a powder inlet (from 50) is provided, and that the mixer (52) mixes the powder with a flow of conveying gas, and then the outlet (see line 26) for the mixture of coating material powder/conveying gas is connected to the injector (see 20) for powder to the spray gun. Figure 1 and column 4, line 50 through column 5, line 5.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Kunzli in view of Payne to provided the claimed mixer system, as suggested by Huhne with an expectation of desirable spraying results, because Kunzli in view of Payne teach thermal spraying with powder, with Kunzli teaching to use a conveying gas/powder mixture from the injector, and Huhne teaches a conventional system for thermal spray guns that provides the conveying gas/powder mixture.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792